

**What is claimed is:**

1. A polymeric composition comprising:
  - (a) a free-radical reactive polymer,
  - (b) a free-radical inducing species,
  - (c) a free radical trapping species having at least one trapping site and a thermally-reversible bond contribution site, and
  - (d) a complementary, thermally-reversible bond contributor,wherein the free radical trapping species substantially suppresses degradation of the polymer in the presence of the free-radical inducing species and at a trapping site, being graftable onto the polymer after the polymer forms a free radical.
2. The polymeric composition of Claim 1 wherein the resulting polymer being a rheology-modified polymer having a gel content as measured by cyclohexane extraction (ASTM 2765) of less than about 10 weight percent.
3. The polymeric composition of Claim 1 wherein the resulting polymer being a rheology-modified polymer having a gel content as measured by cyclohexane extraction (ASTM 2765) of less than about an absolute 5 weight percent greater than the gel content of the base polymer.
4. The polymeric composition of Claim 1 wherein the resulting polymer being a thermally-reversibly crosslinked polymer having a gel content as measured by cyclohexane extraction (ASTM 2765) of at least about 10 weight percent.
5. The polymeric composition of Claim 1 wherein the resulting polymer being a thermally-reversibly crosslinked polymer having a gel content as measured by cyclohexane extraction (ASTM 2765) of at least about an absolute 5 weight percent greater than the gel content of the base polymer.
6. The polymeric composition of Claim 1 wherein the polymer is selected from the group consisting of butyl rubber, polyacrylate rubber, polyisobutene, propylene homopolymers, propylene copolymers, styrene/ butadiene/ styrene block copolymers, styrene/ ethylene/ butadiene/ styrene copolymers, polymers of vinyl aromatic monomers, vinyl chloride polymers, and blends thereof.

7. A polymeric composition comprising:
  - (a) a free-radical degradable polymer being capable of forming free radicals when subjected to shear energy, heat or radiation,
  - (b) a free radical trapping species having at least one trapping site and a thermally-reversible bond contribution site, and
  - (c) a complementary, thermally-reversible bond contributor,wherein the free radical trapping species (i) substantially suppresses degradation of the polymer when the polymer is subjected to shear energy, heat, or radiation and (ii) at a trapping site, being graftable onto the polymer after the polymer forms a free radical.

8. A polymeric composition comprising:
  - (a) a free-radical reactive polymer,
  - (b) a free-radical inducing species,
  - (c) a free radical trapping species having at least one trapping site and a thermally-reversible bond contribution site, and
  - (d) a complementary, thermally-reversible bond contributor,wherein the free radical trapping species substantially suppresses carbon-carbon crosslinking of the polymer in the presence of the free-radical inducing species and at a trapping site, being graftable onto the polymer after the polymer forms a free radical.

9. The polymeric composition of Claim 8 wherein the polymer is selected from the group consisting of acrylonitrile butadiene styrene rubber, chloroprene rubber, chlorosulfonated polyethylene rubber, ethylene/alpha-olefin copolymers, ethylene/diene copolymer, ethylene homopolymers, ethylene/propylene/diene monomers, ethylene/propylene rubbers, ethylene/styrene interpolymers, ethylene/unsaturated ester copolymers, fluoropolymers, halogenated polyethylenes, hydrogenated nitrile butadiene rubber, natural rubber, nitrile rubber, polybutadiene rubber, silicone rubber, styrene/butadiene rubber, styrene/ butadiene/ styrene block copolymers, styrene/ ethylene/ butadiene/ styrene copolymers, and blends thereof.

10. A polymeric composition comprising:

(a) a free-radical reactive polymer being capable of forming free radicals when subjected to shear energy, heat or radiation,

(b) a free radical trapping species having at least one trapping site and a thermally-reversible bond contribution site, and

(c) a complementary, thermally-reversible bond contributor,

wherein the free radical trapping species (i) substantially suppresses carbon-carbon crosslinking of the polymer when the polymer is subjected to shear energy, heat, or radiation and (ii) at a trapping site, being graftable onto the polymer after the polymer forms a free radical.